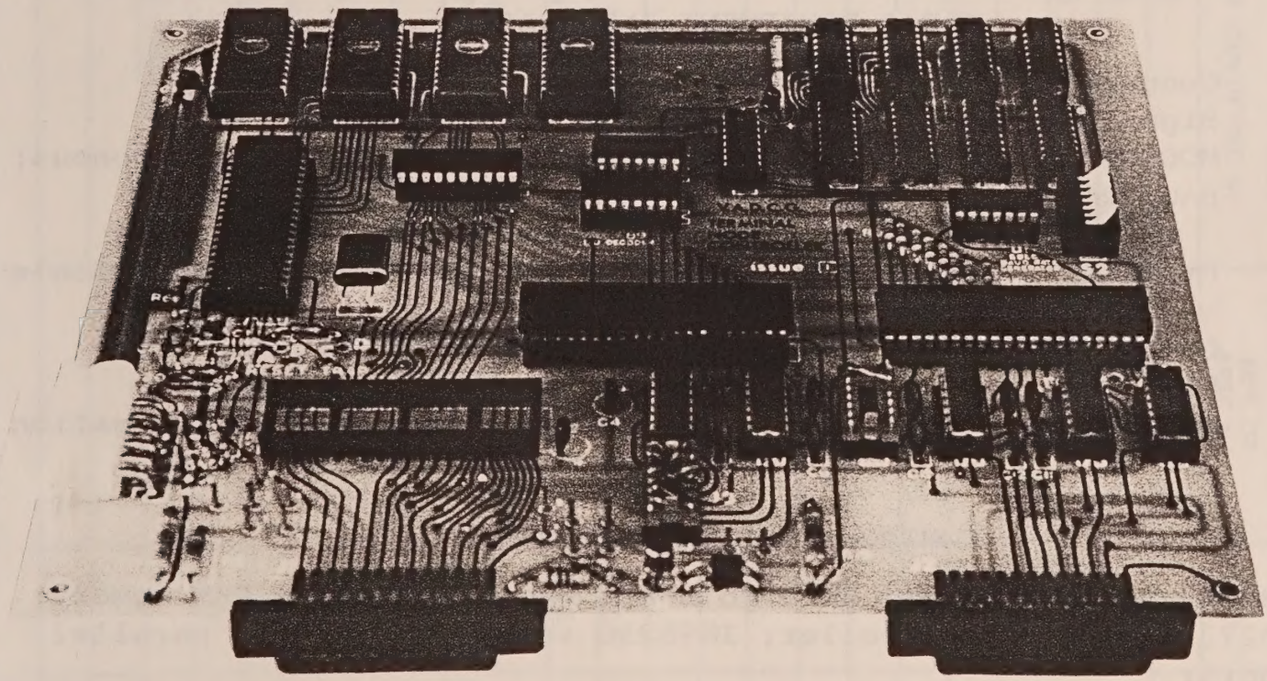
ASCII INFORMATION ON RADIO

.. .. ERROR~FREE

Now you too can take advantage of CLEAN data transfer via Amateur Radio Links to drive CRT's, teletypes, printers, or even unforgiving computer systems. The Vancouver Amateur Digital Communications Group (a non-profit group) has developed a stand-alone PACKET RADIO CONTROLLER to link you with a growing network. The bit-oriented protocol and firmware construction assures that it won't become obsolete . Older start-stop methods are losing out to bit-oriented data transfer methods, yet the controller can translate between the old and the new...including ASCII. Don't be left behind in the dust! A quick change of an EPROM will make your controller compatable with network up-grades. You can communicate DIRECTLY station to station or through a sophisticated community packet network STATION NODE. The data device may be serial RS232, current loop, or even parallel at the interface...and you also get programmable bit-rates and code conversion!!! Now you can leave your computer free for more important tasks....



The Vancouver Amateur Digital Communications Group is a non-profit organization. At present the Group is making these boards available at our cost. We are relying on voluntary donations to continue our work in raising the level of Amateur Digital Communications. If you wish to assist us financially please send contributions to:

V.A.D.C.G.
818 Rondeau St.
Coquitlam, B.C. CANADA
V3J 5Z3

TERMINAL NODE CONTROLLER SPECIFICATIONS

DIGITAL EQUIPMENT INTERFACE

Connector Type	DB-25-S;
Signal Levels	TTL, EIA RS232, or 20ma. current loop;
Wiring	Standard for EIA cables for DTE equipment and may be patched for DCE equipment;

SERIAL

BAUD Rates	Software selected any speed DC to 56K;
Character Frames	Asynchronous with 5, 6, 7, or 8 bits, Even, Odd, or No-Parity bit generation and detection, 1, 1½, or 2 Stop-bits;
Buffering	Double character string buffering, Prioritized interrupts;
Control Signals	CTS, RTS, DSR, DTR, RI, and DCD; False start bit detection, Line-BREAK generation and detection, software readable interface status;

PARALLEL

Buffering	Double character string buffering;
Signals	Multiple 8-line unidirectional and bi-directional inputs and outputs with programmable interrupt controls;

RADIO EQUIPMENT INTERFACE

Connector Type	DB-25-S;
Signal Levels	TTL or EIA RS232;
MODEMS	Asynchronous or self-clocking Synchronous;
BAUD RATES	600, 1200, 2400, 4800, 9600, 19,200, or 38,400 bits per second
Protocol	Either SDLC or HDLC bit-oriented protocols with full or half duplex;
Control Signals	CTS, RTS, DSR, DTR, DCD, RT, and TT;
Data Type	NRZI or non-NRZI data type;
Interrupts	Both data transfers and status information are under interrupt control;

CONTROLLER ARCHITECTURE

8085 microprocessor; 4K 2708 EPROM memory; 4K 2114 RAM memory; 8273 data-link controller; INS8250 serial port; 8255 parallel port;

POWER SUPPLY (full population)	Off Board	+12 volts @ 300ma. max.
		-12 volts @ 50ma. max.
		+5 volts @ 1.5A. max.(split)
		-5 volts @ 200ma max.
BOARD	7.75" x 8.5" inches, double sided G-10 glass epoxy with plated holes	

VANCOUVER AMATEUR DIGITAL COMMUNICATIONS GROUP
818 RONDEAU STREET
COQUITLAM, BRITISH COLUMBIA
CANADA V3J 5Z3

VANCOUVER AMATEUR DIGITAL COMMUNICATION GROUP	PARTS LIST TERMINAL NODE CONTROLLER	SIZE A	CODE IDENT. No.	PL 800314	REV nc
					SHEET 3 OF 4

ITEM No./ CKT. SYM.	NOMENCLATURE OR DESCRIPTION	PART OR IDENTIFYING No.	MFR. OR SPEC. No.	QTY.	PROD. QTY.	PURCH. ORDER	COST
CR1	Diode	1N4148					
CR2	"	1N4005					
CR3	"	1N4005					
J1	Socket, RS232	DB25S					
J2	" "	DB25S					
J3	" 16 pin I.C.						
J4	" 14 pin I.C.						
P1	Plug, 6 pin right-angle (male)	Molex model #A2534	Order No.09-88	-2061			
P2	Socket for P1 (female) off-board	Molex eng. no. 2139	Order No. 09-50	-7061			
Q1	Transistor	2N2907					
S1	Switch, 7 pole DIP						
X1	Crystal, HC-18 holder, 30 pF	4.9152 MHz					
	Printed Circuit Board						

VANCOUVER AMATEUR DIGITAL COMMUNICATION GROUP	PARTS LIST TERMINAL NODE CONTROLLER	SIZE A	CODE IDENT. No.	PL 800314	REV nc
					SHEET 4 OF 4

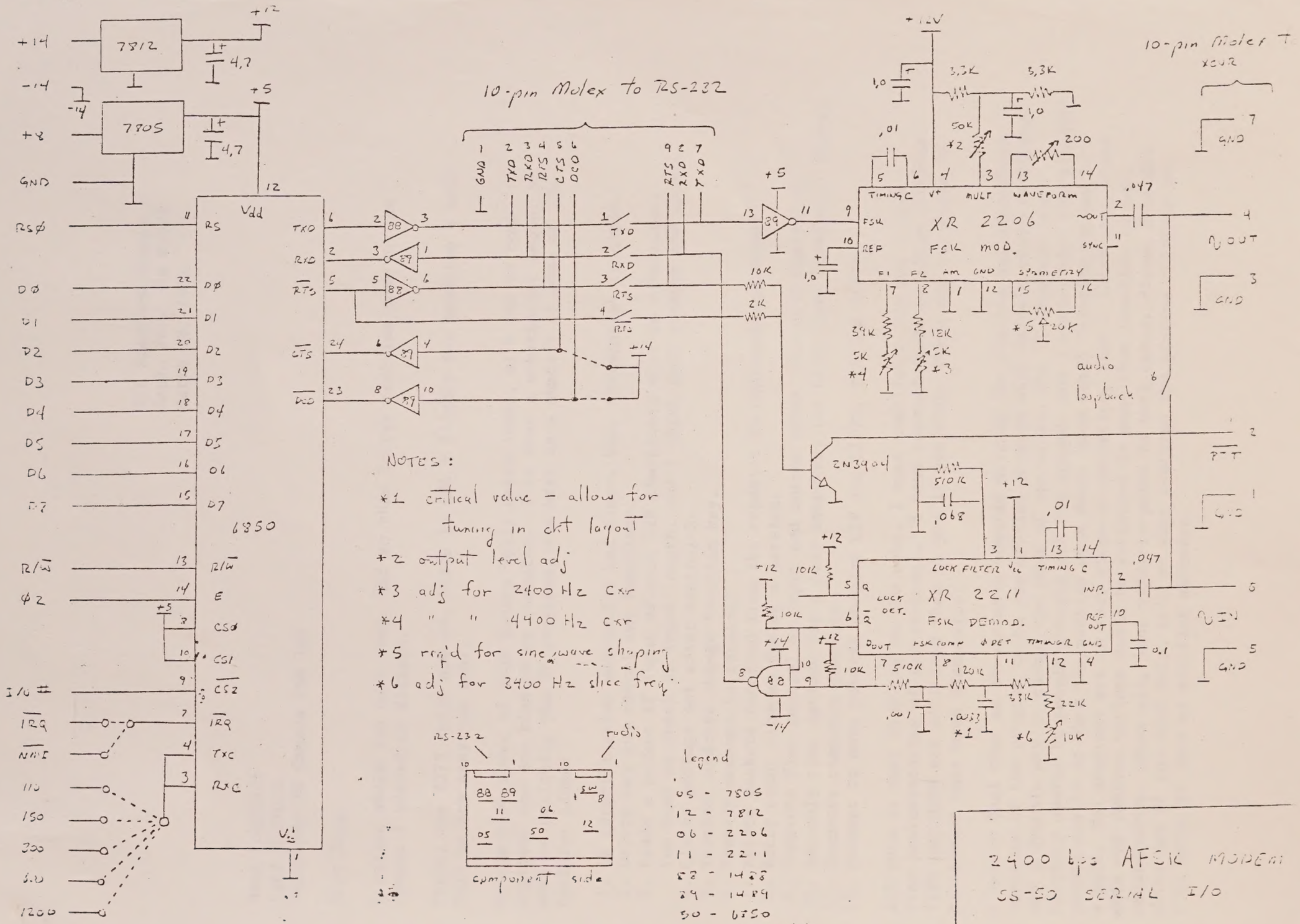
ITEM No./ CKT. SYM.	NOMENCLATURE OR DESCRIPTION	PART OR IDENTIFYING No.	MFR. OR SPEC. No.	QTY.	PROD. QTY.	PURCH. ORDER	COST
R1	Resistor, 1 watt, 430 ohm						
R2	" ½ watt, 150 ohm						
R3	" ¼ watt, 1000 ohm						
R4	" " 33K ohm						
R5	" " "						
R6	" " "						
R7	" " "						
R8	" " "						
R9	" " "						
R10	" " "						
R11	" " "						
R12	" " "						
R13	" " "						
R14	" " "						
R15	" " "						
R16	" " "						
R17	" ½ watt, 510 ohm						
R18	" ¼ watt, 2200 ohm						
R19	" 1 watt, 430 ohm						
R20	" ¼ watt, 33K ohm						

VANCOUVER AMATEUR DIGITAL COMMUNICATION GROUP	PARTS LIST TERMINAL NODE CONTROLLER	SIZE A	CODE IDENT. No.	PL 800314	REV nc
					SHEET 2 OF 4

ITEM No./ CKT. SYM.	NOMENCLATURE OR DESCRIPTION	PART OR IDENTIFYING No.	MFR. OR SPEC. No.	QTY.	PROD. QTY.	PURCH. ORDER	COST
C1	Capacitor, Tantalum, 1uF , 6 volt						
C2	" Ceramic , 0.1 uF ,100 volt						
C3	" " " "						
C4	" " " "						
C5	" " " "						
C6	" Mica , 330 pF "						
C7	" " " "						
C8	" " " "						
C9	" " " "						
C10	" " " "						
C11	" " " "						
C12	" " " "						
C13	" " " "						
C14	" " " "						
C15	" " " "						
C16	" Ceramic , 0.1 uF , 100 volt						
C17	" " " "						

VANCOUVER AMATEUR DIGITAL COMMUNICATION GROUP	PARTS LIST TERMINAL NODE CONTROLLER	SIZE A	CODE IDENT. No.	PL 800314	REV nc
				SHEET 1 OF 4	

ITEM No./ CKT. SYM.	NOMENCLATURE OR DESCRIPTION	PART OR IDENTIFYING No.	MFR. OR SPEC. No.	QTY.	PROD. QTY.	PURCH. ORDER	COST
U1	I.C., CPU	8085A	Intel				
U2	" PIO	8255A	Intel				
U3	" SIO	WD8250	Several				
U4	" RS232 TX	MC1488					
U5	" RS232 RX	MC1489					
U6	" 8 bit Latch	74LS373					
U7	" Quad Nand	74L00					
U8	" 1 of 8 Decoder	74LS138					
U9	" 1 of 8 "	74LS138					
U10	" SDLC	8273	Intel				
U11	" Baud Rate Generator	4024					
U12	" RS232 TX	MC1488					
U13	" RS232 RX	MC1489					
U14	" "	MC1489					
U15	" Eprom, 1K Byte	2708					
U16	" " "	2708					
U17	" " "	2708					
U18	" "" "	2708					
U19	" Ram, 1K x 4, 450 nSec	2114					
U20	" " " "	2114					
U21	" " " "	2114					
U22	" " " "	2114					
U23	" " " "	2114					
U24	" " " "	2114					
U25	" " " "	2114					
U26	" " " "	2114					


10-pin Molex to RS-232
10-pin Molex T
xcvr
7812
7805
+14
-14
+8
GND
+12
+5
4.7
Vdd
6850
RS
D0
D1
D2
D3
D4
D5
D6
D7
R/W
Φ2
CS0
CS1
CS2
IRQ
TXC
RXC
TXD
RXD
RTS
CTS
DCD
I/O #
110
150
300
600
1200
GND
TXD
RXD
RTS
CTS
DCD
88
89
XR 2206
FSK MOD.
TIMING C
MULT
WAVEFORM
FSK
REF
SYNC
SYMMETRY
audio loopback
2N3904
PTT
XR 2211
FSK DEMOD.
LOCK FILTER
TIMING C
INP.
REF OUT
DOUT
FSK COMP
DET
TIMING R
GND
LOCK DET.
NOTES:
*1 critical value - allow for tuning in ckt layout
*2 output level adj
*3 adj for 2400 Hz cxr
*4 " " 4400 Hz cxr
*5 req'd for sine wave shaping
*6 adj for 2400 Hz slice freq
RS-232
radio
component side
legend
05 - 7805
12 - 7812
06 - 2206
11 - 2211
88 - 1488
89 - 1489
50 - 6850
sw - dip switch
2400 bps AFSK MODEM
SS-50 SERIAL I/O
N. Pearl J. Orsak 79/10

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https://archive.org/details/vadcg-tnc-control-parts

311 Stanford Avenue
Menlo Park, CA 94025
March 18, 1981

Doug Lockhart
1263 Balfour
Vancouver BC Canada V6H 1X6

Dear Doug,

I called while you were away, and so this letter contains some of the issues I wished to discuss.

First, the 8273 chips are in. Price is $34 + $1/chip for handling & mail. Tell me how many you want.

We now have three of your boards fully operational, with two at home stations and one tied to my computer. I've done a substantial amount of work on polishing the TT programs, and here is a summary of some of the features added:

1. CW identification subroutine and timer. Uses transparent transmit.
2. Delete key and cancel key functions.
3. Sends a packet if input exceeds 128 characters with no terminator. You have no check on input length, and I think that crashes the board.
4. Cleans garbage out after control-X.
5. Terminal address change function key.
6. Powerup message to terminal
7. Prints packets received from the repeater in non-connected mode.
8. Retry count exhaust during a session.
9. Complete flow control on input and output using Control-S Control-Q.
10. Assembly time options for a host computer. (no echo, more terminator chars)
11. Comments comments comments
12. Attempt to move towards merging LIP and LIPTT, TIP and TIPTT.

All this is just frosting on the cake. I must compliment you for a very fine implementation of the protocol. I have renamed these modified versions TIPM and LIPM and will send them to you if you wish. There are two items in particular that need discussion:

I really feel that we should move towards merging the station and standalone versions of the program to be one unified program with default characteristics and a dynamic way to change the mode of operation. The TT programs are terribly useful to people getting off the ground, and I wonder what the station people are to do when the station goes down. Drop dead? Changing eproms is a pain. The programs are so very close in operation, that I think some minor mods and runtime options could be installed to make them function in both environments. After all, your point-to-point in both cases. Please consider this, and if you need help, tell me what features the station requires and I'll merge it into my modified software.

Next, in testing end-to-end flow control I've run into two bugs I can't easily diagnose. If the operator suspends output printing the LIP buffer fills up, the link goes not-ready, the source TIP buffer fills up and finally a control-s is sent to the host. That all seems to work. When printing resumes, the LIP buffer is emptied ok, the link goes ready, but then there seems to be an NR-NS mismatch and no more data is transferred. If a control-Y is sent to the host, it starts sending garbage and eventually crashes. Any ideas? I hope it's not something I caused by my changes.

Well I have commitments from people for more boards, and no less than five speaking engagements from interested clubs or groups. There is a short article on the repeater coming in April QST.

73,

Hank